Chapter 3
PLANNING AREA DESCRIPTION

SUMMARY OF WATER RESOURCE SYSTEMS

The Kissimmee Basin (KB) Water Supply Planning Area encompasses that portion of the SFWMD extending from southern Orange County, south along the Kissimmee River to the north shore of Lake Okeechobee. The area has extensive surface water and ground water systems. The upper region of the KB Planning Area contains hundreds of lakes, including a series of interconnected lakes called the Kissimmee Chain of Lakes. The Chain of Lakes are managed according to a regulation schedule for each lake subbasin. The lower portion of the Kissimmee Basin includes the tributary watersheds of the Kissimmee River between Lake Kissimmee and Lake Okeechobee. The channelized portion of the Kissimmee River (C-38) contains six water control structures which divide it into five pools. The water levels of these pools are regulated. Additional inflows into Lake Okeechobee include the S-154, Taylor Creek-Nubbin Slough, Lake Istokpoga, and Fisheating Creek subbasins.

Surface Water Sources

Despite the abundance of surface water sources in the Kissimmee Basin, a relatively small amount or surface water is withdrawn for urban or agricultural uses. Although there is variation throughout the KB Planning Area, a majority of users rely on ground water as the primary source of water. One notable exception to this is a region of large agricultural activity located in the lower portion of the KB Planning Area near Lake Istokpoga. The area between Lake Istokpoga and the northwest shore of Lake Okeechobee is identified as the Lake Istokpoga-Indian Prairie Basin. Lake Istokpoga is a major source of water to the growers within the basin, including the Seminole Tribe of Florida. Several water shortages in the mid-1980s made the region aware that Lake Istokpoga was at or near its limit on available water for use. Studies and resulting corrective actions were taken in the late 1980s and 1990s to remediate the immediate availability concerns, but water use restrictions on additional surface water use have remained in place. In addition, the District has entered into a water rights compact with the Seminiole Tribe to ensure the Tribe’s estimated historic entitlement/allotment of water. To address water resource issues in the Lake Istokpoga-Indian Prairie Basin, the plan evaluated surface water supply availability and management options.

Ground Water Sources

The ground water resources in the Kissimmee Basin are divided into the Surficial, Intermediate, and Floridan aquifer systems. The Surficial Aquifer System (SAS) generally yields low quantities of water and generally consists of unconsolidated materials. With the exception of a few isolated areas, the Intermediate Aquifer System (IAS) does not produce large quantities of water either, but acts as a confining layer for the underlying Floridan

Aquifer System (FAS). The FAS is capable of producing large amounts of water throughout the KB Planning Area. However, total dissolved solids, sulfates, and chloride concentrations generally increase with depth and distance to the south.

The FAS has historically been the primary source of water supply for urban uses in the northern area of the region, where its water quality is good. As population and agricultural demands on this resource increase, the potential for impacts to natural systems and to the aquifer itself, particularly in the metropolitan Orlando area may also increase. An important part of this water supply plan was to examine the potential for adverse impacts to occur and to explore alternative water sources to avoid or mitigate these impacts where possible.

Climatic Conditions

Both surface water and ground water are dependent upon rainfall for recharge. However, this dependency on rainfall varies among different aquifer systems. The SAS, which is exposed at the land surface, is primarily recharged by rainfall. The deeper, confined FAS, by contrast, relies more heavily upon ground water inflow for recharge. This ground water inflow, in turn, originates in recharge areas where the confining unit is thin or where sinkholes are numerous. These conditions exist in the northwestern portion of the KB Planning Area and provide for the highest recharge to the FAS within the SFWMD. In addition, the FAS receives artificial recharge from about 400 drainage wells in the city of Orlando and by reclaimed water infiltration basins.

The average rainfall in the KB Planning Area is about 50 inches per year. There is a wet season from June through October, and a dry season from November through May. The heaviest rainfall occurs in June or July, averaging 7.7 inches for the month; the lightest rainfall month is usually in November or December, averaging 1.8 inches for the month. On average, 64 percent of the annual rainfall occurs in the wet season.

SUMMARY OF NATURAL SYSTEMS

The KB Planning Area contains a variety of natural wetland and upland communities. Most wetland systems in the KB Planning Area drain into the Kissimmee River, and subsequently Lake Okeechobee. The floodplain was once used by a larger number of birds, mammals, fish and other species. Restoration of parts of the original meandering channel is taking place, in order to improve wetland habitat. The Kissimmee River Restoration Project will restore over 40 square miles of the existing channelized system, including 43 continuous miles of river channel and about 27,000 acres of wetlands. The project is expected to benefit over 320 fish and wildlife species (Toth et al., 1998).

Shingle Creek and Reedy Creek swamps, two large forested wetlands in the northernmost reaches of the KB Planning Area, start the headwaters of the Kissimmee Chain of Lakes. These two wetland systems flow slowly southward and drain into Lake Tohopekaliga. Lake Tohopekaliga and the Alligator Chain of Lakes drain into Cypress

Lake, which in turn flows into Lake Hatchineha and then into Lake Kissimmee. Large herbaceous marshes surround Cypress Lake, the north end of Lake Hatchineha, and the entire shoreline of Lake Kissimmee. The Alligator Chain of Lakes is surrounded by large areas of forested cypress and mixed hardwood swamps, as well as smaller pockets of herbaceous marsh.

Native uplands, which are interspersed throughout the KB Planning Area, are non-wetland areas with intact ground cover, understory, and canopy. Native uplands in the KB Planning Area include longleaf and slash pine forests, live oak hammocks, sand pine scrub, cabbage palm, turkey oak, hardwood forest, palmetto prairies, and dry prairie grasslands. Uplands are also an important source of wildlife habitat.

LAND USE TRENDS AND WATER DEMANDS

The existing land use in the KB Planning Area is generally more urban in the north than in the south. Continued urbanization is anticipated in the north, while in the south, agricultural acreage is projected to increase (**Table 2**)

Table 2. Acreage and Percentage of Land Use by County Area.[a]

Land Use	Orange Area	Osceola Area	Polk Area	Highlands Area	Okeechobee Area	Glades Area	Kissimmee Basin Area
Agriculture	31,513 (17%)	218,656 (35%)	44,243 (16%)	259,362 (53%)	189,625 (52%)	139,470 (47%)	882,869 (40%)
Urban	60,243 (32%)	52,212 8%	51,449 (19%)	42,194 (9%)	21,928 (6%)	2,760 (1%)	230,786 (10%)
Wetlands	36,338 (20%)	164,355 (27%)	59,571 (22%)	76,821 (16%)	66,800 (18%)	59,678 (20%)	463,563 (21%)
Forest	30,264 (16%)	74,857 (12%)	65,136 (24%)	41,586 (9%)	32,591 (9%)	68,578 (23%)	313,012 (14%)
Rangeland	2,005 (1%)	26,012 (4%)	25,270 (9%)	33,489 (7%)	48,284 (13%)	20,223 (7%)	155,283 (7%)
Barren	3,419 (2%)	2,842 (1%)	1,420 (1%)	3,733 (0%)	3,588 (1%)	2,471 (1%)	17,473 (1%)
Water	21,796 (12%)	81,082 (13%)	23,885 (9%)	30,022 (6%)	4,299 (1%)	1,492 (1%)	162,576 (7%)
Total	185,578 (100%)	620,016 (100%)	270,974 (100%)	487,207 (100%)	367,115 (100%)	294,672 (100%)	2,225,562 (100%)

a. Data for the portion of county within the Kissimmee Basin Planning Area only.
Source: SFWMD Florida Land Use/Land Cover GIS database, 1995.

The rapid conversion of rural land into urban areas is expected to continue in southern Orange County and northwestern Osceola County. Additionally, continued urban development is expected in Polk County along the I-4 Corridor. The remaining areas in the Kissimmee Basin are expected to remain largely rural through the 2020 planning period.

Population in the planning region is projected to increase by 89 percent, from 362,837 in 1995 to 686,696 in 2020 (**Table 3**). Urban water demands are projected to increase by 76 percent from 35,602 million gallons per year (MGY) in 1995 to 68,153 in 2020. The majority of these urban demands will occur in the highly populated Orange-Osceola County Area, which includes southern Orange and northern Osceola counties. Agricultural water demands are forecast to increase by 54 percent, from 112,668 MGY in 1995 to 173,995 MGY in 2020 under average rainfall conditions. Under 1-in-10 year drought conditions, the projected agricultural water demands are forecast to increase to 206,590 MGY in 2020. The increases in urban water supply are projected to come initially from ground water sources.

Table 3. Population and Water Demands, 1995-2020.

	1995	2020 (average)	% Change	2020 (1-in-10)
Population	362,837	686,696	89	
Water Demands (MGY)				
Urban	35,602	68,153	76	72,851
Agricultural	112,668	173,995	54	206,590
Total Water Demands	148,270	242,148	63	279,441

Agriculture is the primary existing and projected water user within the basin. Information regarding the number and location of existing (1995) agricultural acres was determined through aerial photography collected by the USGS. The crop acreage, type and location determined by this method were used to calculate water use based upon the Blaney-Criddle evaporative loss model. These values became the baseline information from which future projections were made. Agricultural projections for 2020 came from the 1998 Districtwide Water Supply Assessment (DWSA) and from input from the agricultural community. Water use for the projected crops was again estimated using the Blaney-Criddle evaporative loss model. The summary of the estimated use is provided in **Table 3**.

Citrus is the major irrigated agricultural crop in the KB Planning Area. A major change in the geographic distribution of citrus production occurred in Central Florida following a series of severe freezes in the 1980s. Since then, a reduction in citrus acreage has taken place in the northern areas of the Kissimmee Basin. Conversely, to the south, significant increases in citrus acreage have been observed. These general trends in citrus acreage are projected to continue through 2020.

The second largest projected increase in agricultural water use comes as a result of the proposed addition of sugarcane. Until 1995, a relatively small amount of sugarcane was grown within the KB Planning Area. Recent water quality issues in areas south of Lake Okeechobee and the construction of a new mill have made the production of sugarcane more attractive for portions of Highlands and Glades counties. Sugarcane

production is projected to increase 362 percent over its current levels to an estimated total of 15,308 acres. Water for this additional use is projected to come from surface water.